

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

AUGUST 7, 1950

\$6.00
A YEAR

airline passengers
may vary...

but they all share in the same high
spark plug reliability when they fly in



equipped planes



There is considerable variety among the steadily increasing
number of people who prefer to travel by air.
But whether they are men or women, old or young,
on business or pleasure-bent, they are all beneficiaries
of the utmost ignition reliability when the aircraft
in which they fly are equipped with **BG** Spark Plugs.

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The planes of tomorrow are on the drawing boards of the aviation industry today. What they are ready to take to the air, the right fuels and lubricants will be waiting for them. This fact is ensured by research projects such as those currently under way at the Research & Development Department of the Standard Oil Company at Whiting, Indiana.

Right now, Standard offers the experience, fuels and lubricants that can be in high favor with pilots of all types of planes. For example, for high-plane owners, there's STANDARD 80/87 aircraft clear aviation gasoline for maximum take-off power and smooth, economical cruise. For heavier aircraft, STANDARD 56/59- and 100/110 octane aviation gasoline assure top performance.

Standard Airport Diesel have these products right now. Count on them to supply your needs every time. And remember, when the planes of tomorrow come off the production line, Standard will be there with the finest products made to keep 'em flying!

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The "Sandy Punch" that comes out of a compressed air hose carries a blow of strength to come in the aviation field. At Kidde & Company, we've become interested with the vast possibilities of pneumatics as a power source in flight. We've found that, considering weight, visibility of the medium and other factors, pneumatic power is extremely efficient for operating airborne equipment. We've designed a lightweight air compressor that delivers huge volumes of high pressure air at high speeds... built lightweight aircraft pneumatic regulators and other accessories. If you're working on airborne pneumatic problems, perhaps we can cooperate with your engineers by exchanging experience and advice.



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Pneumatic Devices
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**AIR COMPRESSORS
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News Picture Highlights . . .



Fairchild 17 TURBOPROP DEMONSTRATES CAPABILITIES

Beech T-34 Mentor is about to fold the wings of the new Fairchild 17 turboprop plane landing on its deck for the first time. The plane is powered by an Armstrong Siddeley Double Mamba turbofan rated propulsive. Note the excellent pilot visibility, a major consideration in conversion planes. The right-hand photo shows the Fairchild's novel wing-folding scheme, each wing bending in two places to permit storage aboard transport aircraft. The plane features a retractable 'bathtub' nose landing gear.



BRITISH TURBOPROP FIGHTER

Overall view of Westland's single-seat nightfighter built for Britain's Royal Navy, painted up as the unit's high-wing day fighter at extended position. The Wysers bear an Armstrong Siddeley Prima turboprop rated at 3670 rpm. on takeoff.



NEW S-52 VERSION TESTED

Front right view of Sikorsky's new S-522, a military version of the S-52. The three-seater is powered by a 245-hp Franklin and has a top speed of about 115 mph. Climbing rate is about 400 ft. USAM has designated the craft YR-10A.



SKYNIGHT BECOMES AIRBORNE

Powerful Douglas F3D Skynight night fighter takes off at Los Angeles on a test flight. The big center-line two-seater is powered by two Westinghouse J34s mounted at either side of the fuselage under the wings. The F3D is in the all-suspension class and can operate well over 40,000 ft. The plane incorporates a tunnel escape hatch for emergency exit.



The superb combination of **Lycoming** power and **Piper** design has brought an amazingly widespread acceptance for two new **Piper** planes:

The new four-place Piper **Pacer** provides high performance and safe, economical transportation—on cross-country flights the cost per passenger is less than for bus fare. Such outstanding economy requires—in addition to efficient tail-frame design and low first cost—the low fuel and oil consumption and the low service maintenance provided by **Lycoming's** O-320-D 125-hp-horsepower engine.

Lycoming powers the **Piper Super Cub**, too. This famous plane offers greater rate of climb, faster cruising speed, shorter take-off—greater all-around performance with the 115-horsepower **Lycoming** O-320-C. You can be sure of your plane when it's...

IN PERSONAL PLANES
THE CHIEF IS TO LYCOMING

LYCOMING
PUTS THE **PACE** IN THE
PIPER PACER...
AND POWERS THE SUPER CUB

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The only APPROVED Monobloc System for Advanced Radar, Communications, and Electronic Equipment

Breeze "Monobloc" with single piece plastic inserts, offer outstanding advantages in assembly, wiring, mounting and service in the field.

Single piece inserts make a tighter seal, eliminate the space voids common in multiple-piece inserts, greatly reduce the opportunity for moisture shorts.

Reversible contact pins make possible a broad variety of lead spacing, once the assembly of Breeze Waterproof Connectors and panel-type "Monobloc" Monitors.

Single-hole Panel Mounting is all that is required for either Waterproof or Pressure Sealed types.



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If you have a rough connector problem, call BREEZE for the answer.

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478 South Sixth Street, Newark 7, N.J.

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Newark, Newark
New York, New York
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type of high
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protection
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developed.
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single piece
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seals.

TELE-MONITOR
1958: First
"Tele-Monitor"
developed.
1959: First
"Tele-Monitor"
with a
sealing
device
developed.

AVIATION CALENDAR

Aug. 24-26-National Safety Council, Grand Rapids, Mich.

Aug. 25-26-Second Newark program on high temperature ceramics, Massachusetts Institute of Technology, Cambridge, Mass.

Aug. 26-First United States International Trade Fair, Chicago.

Aug. 14-16-National West Coast meeting of the Society of Automotive Engineers, Hotel Edgewater, Los Angeles.

Aug. 19-20-California Air Freight Clinic, sponsored by Calif. Automobile Chamber and Official Chamber of Commerce Aviation Committee, Oakland.

Aug. 20-22-Fourth Annual Air Force Annual convention, Hotel Statler, Boston.

Sept. 4-16-British Army dealer and exhibitors, Society of British Aircraft Constructors, Farnborough airfield, England.

Sept. 7-9-Fleet & Whiteman's electrical spot and aircraft wiring conference, Pacific Standard Hotel, Los Angeles, Calif.

Sept. 9-11-Third annual convention of the California Wing of the Air Force Arms, Arrowhead Inn Hotel and Spa near San Bernardino, Calif.

Sept. 10-12-Second meeting of America's instrument manufacturers and exhibitors, the Califormia Wing, San Francisco.

Sept. 12-14-Conference on ground facilities for transportation, Massachusetts Institute of Technology, Cambridge, Mass.

Sept. 14-22-50th annual instrument conference and exhibit, Memorial Auditorium, Buffalo, N.Y.

Sept. 19-21-Joint meeting on navigation and electronics sponsored by the Institute of Navigation, the Society of Automotive Engineers and the Radio Technical Commission for Maritime Services, Hotel Statler, New York, N.Y.

Sept. 21-27-1958 national electronic conference, Edgewater Beach Hotel, Chicago.

Sept. 22-27-1958 national electronic conference, Hotel Statler, Los Angeles, Calif.

Sept. 25-28-1958 annual convention of the International Air Transport Association, San York, Idaho.

Oct. 11-13-1958 conference on aircraft management and acquisition, Mac West Hotel, North Campus, University of California, Berkeley, Calif.

Oct. 19-22-1958 annual general meeting of the International Air Transport Association, Fairmont Hotel, San Francisco.

Oct. 24-26-Third Annual Materials Handling Conference sponsored by Westinghouse Electric Corp., Hotel Statler, Buffalo, N.Y.

Oct. 26-28-Flight Safety Foundation's annual Safety Seminar, Danvers Hotel, Danvers, Mass.

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Procurement Goal Pushed to \$7.7 Billion

More funds asked for Naval planes, foreign air aid.

By Alexander McFarley

The biggest Naval air arm since World War II is in the making last week as the air force budget was raised to \$9 billion by Congress.

In addition, funds for foreign military aid commitments totaling \$4 billion were added to the \$1.5 billion available U.S. total cost of new planes for the long duration of Europe and up with the U.S. against Soviet aggression.

► **More Navy Planes**—A new limit on Navy funds—\$39.4 million—and the \$4-billion sum were authorized as additional air grants from President Truman, members of the House Appropriations Committee and last week, to be added to the \$30.5 billion previously agreed upon (AVIATION WEEK July 31). The grand total of new and domestic funds now sought on a military basis had reached \$35.4 billion.

House Appropriations committees last week were holding 12-hour hearings sessions trying to get the comprehensive authority of the large emergency budget request strengthened out. Some state Washington observers thought the bill might even be passed through both House and Senate by August 15.

The new figure独占着 the total allocated for Navy air power in 1950 up to \$3.2 billion. This is just over the total of \$2.8 billion which had been budgeted for both Air Force and Navy planes in the regular 1951 fiscal year budget bill, now approved by both houses of Congress.

► **Foreign Planes**—How much of the foreign funds was authorized for air power had not yet been fixed last week. It was agreed, however, that at least \$1.2 billion of the total foreign budget 1950 would go for planes. Some Washington sources reported a sum to stand at least 1000 U.S. jet fighters in Europe in addition to whatever "softie" planes of World War II were maintained for our allies.

Members of the House Appropriations Committee and the calm Navy funds was needed to start building the Navy's plane strength to a level comparable to that sought for the Air Force.

The Rising Air Power Budget

Soft more emergency funds requested by President Truman last week boosted totals for 1951 air power budget high above the July 26 figure (AVIATION WEEK July 31). Latest additions were \$900 million more for Navy aircraft procurement, and an undetermined figure for aircraft procurement for foreign aid, estimated at around \$1 billion.

With these additions here is what the 1951 air power budget, including foreign aid, looked like last week (all sums are in billions of dollars):

| | |
|---|--------|
| Total domestic appropriation request | \$11.4 |
| Total foreign aid appropriation request | 4.0 |
| Total emergency request | 15.4 |

For Procurement

| | |
|--|--------|
| Total previously allotted for new planes (domestic), emergency request | \$3.3 |
| New additional Navy funds requested | 6.9 |
| New emergency total | 4.2 |
| Allocation previously agreed upon by Congress for 1951 Air Force and Navy planes | 2.29 |
| Total new budgeted for 1951 (domestic) Military plane procurement | 6.49 |
| Amount previously allocated by Congress for planes for foreign aid | 0.284 |
| Estimated share of \$4 billion new request for foreign aid to go for military planes | 1.8 |
| Total estimated for air power in 1951 budget | \$ 7.7 |

► **Ten Big Changes**—Even before the additional plane funds were added to the Navy's budget, Chairman Carl Vinson of the House Armed Services Committee reported that three big aircraft carriers would be activated, bringing the total to ten, and six small carriers bringing the total number of light carriers to 14. Among the carriers are a new one now entering completion, and the current Essex, now under construction.

The new proposed 45-group U.S. Air Force minus last week will stand in Washington as the equivalent of an actual 75-group Air Force.

The original 75-group Air Force called for:

- 4 Heavy bomber groups
- 22 Medium and light bomber groups
- 22 Day fighter groups
- 7 All-weather fighter groups
- 6 Strategic reconnaissance groups
- 4 Tactical reconnaissance groups
- 12 Troop carrier groups

In addition to these 70 groups of planes, there were to be 12 separate squadrons in support, plus the 27 Naval Naval Air Groups.

► **Patton Charged**—Patton asserted last week indicated, however, that the new 65-group Air Force plan would be changed considerably from the original 75-group concept. Obviously, they are to expand tactical aviation as proposed by the Air Force (AVIATION WEEK July 17). But further decisions by the country's already formidable Army board strength is also in prospect, with orders for more B-52s and, at the end.

The new proposed 75-group Air Force did not disclose how many planes would be built under the new conditions, but estimates put the total figure around 4500 planes.

The 75-group Air Force plan proposed for a yearly production of 3000 planes to keep on an average of 12,000 modern planes with \$100 increase planes.

Before the change, the 45-group Air Force was on a basis of only 3000 modern planes with 1500 modern planes to move, and its aircraft procurement budget of around 1500 planes.

underlined that these figures were on a "worried" basis as far as money not already allocated to Congress concerned. But the \$3.5 billion already signed upon by Congress for the regular 1951 Air Force budget was understood to be committed. Tentative allocations were made for planning purposes on the additional \$1.7 billion emergency plane funds for the Air Force requested by President Truman.

Since Navy funds of potential also went to the Air Force last week:

► **Top Contractors**—Air Force listed the names of 18 major aircraft contractors who received what was presumably the bulk of the new plane and engine orders. These included:

Boeing

Aerospace Corp.

Consolidated

Vultee

Aircraft

Convair

Lockheed

Aircraft

North American

Aerospace

Republic

Aircraft

United Aircraft

Aerospace

Aerospace

General

Electric

Corp.

Wright

Aerospace

Corp.

McDonnell

Aircraft

Convair

Corp.

Northrop

Aerospace

Corp.

Piasecki

Aircraft

Corp.

Republic

Aircraft

Corp.

Strategic

Aviation

Corp.

United

Aviation

Corp.

Vertol

Aircraft

Corp.

Wright

Aerospace

Corp.

Yerkes

Aircraft

Corp.

Yerkes



F-86 CAMO HOME after wing hit mine.



MORE wing damage-F-86 hit mine.



AA SHELL hit the hole in fuselage.

How Jet Planes Survive Battle Damage

U.S. jet aircraft have won their first combat in Korea and already have answered most questions about how such planes would fare against enemy gun (AVIATION WEEK July 31). Last week graphic evidence of the ruggedness of Lockheed F-80s came to hand: the photographs on this page, and the following report of the Lockheed service representative, Noble G. Heater, in Korea, which was originally shown to AVIATION WEEK. Some parts of Heater's report were cut out by Air Force censors for security reasons.

We have lost three F-80Cs due to enemy action without the loss of a single pilot.

One went blasé, up an antiaircraft gun and got caught in the explosion. The pilot got out (13 Gs being to avoid double layer of smoke, with 20Gs in the leading edge, and one and one-half times from fragments).

Another F-80 flew into a trap (oddly using between two pods), but both top and wing tips—but not both 40-mm shells that he was using—detonated the wind-shield and housing the barrel of the barrel gun so that it stuck out at right angles to the wing position—causing a appreciable amount of the vertical surface to be broken. The pilot then crashed in 13,000 ft and bailed out. He cleared the mountain's wire a little sloppy and was afraid he might have crashed in it to get out while he could.

Another F-80C ran into another trap. The cable sheared off his pilot tube, cut into the leading edge to the forward spar, tore both big tanks off, sheared the left wing tips off plus 22 in. of the tailfin. The pilot clambered to 30,000 ft and came home. He landed downstream in 170 mph with the right hand over and the tail half up—rolled to a stop then hopped up to the line under his own power.

Another F-80C was hit from beneath,



AA SHELL through tailpipe caused to the section left behind the vertical stabilizer.

so was the left wing tip, but both 40-mm shells that he was using detonated the wind-shield and housing the barrel gun so that it stuck out at right angles to the wing position—causing a appreciable amount of the vertical surface to be broken.

Now they are hanging four ordnance in addition to the 203-gal tanks.

They have been hanging out going night and day—but will walk a few feet of a mine—detonated instantaneously. For the 1,000-lightly equipped, it is a job that they are doing—a job that they were never designed to do—but they are doing it.

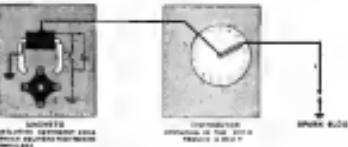
The heating that they are taking with every point wearing a G out is remarkable.



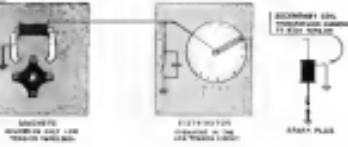
LARGER WING TANK was improvised by lifting outer-center section.

EQUIPMENT

HIGH TENSION IGNITION SYSTEM



HIGH ALTITUDE OR LOW TENSION IGNITION SYSTEM



Inset under legend from Technical Bulletin 10-1000, Low Altitude, Low Tension Ignition System.

ILLUSTRATION COURTESY OF BENDIX CORPORATION
AND HAMILTON, LOW TENSION IGNITION SYSTEM

Low Tension System Gaining Favor

American buys \$1 million worth of Bendix-Selvania equipment for all R-2800s; increased plug life seen.

By George L. Christian

With a \$1 million order in its pocket from American Airlines for low-tension ignition systems (AVIATION WEEK July 31), Bendix has expanded its equipment to the "big two" of engine manufacturers.

When AA's commission of more than 400 engines is completed, approximately three-quarters of all selected aircraft's R-2800 engines will be so equipped. Eastern Air Lines and TWA engineers have confirmed that the system will be installed in their recently ordered Martin 404s.

Although the low-tension system has won considerable airline service as such recently as DC-6s, Constellation, Convair 940s and the SAM 960, American's order is significant because it represents a firm commitment by a single ignition system and because of impressive results obtained during

rigorous service tests. The airline's investment costs, besides 100,000 hr to install \$1 million.

• **Prized** Plug Life—According to Robert Scoville, Manager design at Buffalo, N. Y., the following plug times are obtainable on low-tension equipped engines in tests conducted during the last year:

| ARMED | IGNITION | SPARK |
|--------|----------------|--------|
| AA | Chloroplatinum | 100 hr |
| AA | Chloroplatinum | 117 hr |
| Boeing | Chloroplatinum | 116 hr |
| Boeing | Alumina | 116 hr |
| Boeing | Chloroplatinum | 111 hr |

NOTE: THE TABLES ARE NOT A COMPARISON, BUT ARE BRIEFLY LISTED AS THE SPARKS WERE ON THE SPARK TESTS AND THE ORDERS.

The plug life increased in most cases, but decreased in some. The reasons are not known. The low-tension system is not yet in use on the Pratt & Whitney aircraft engines during the Battle of Berlin, but the Lockheed constant altitude first reached 30,000 ft. Meth engine performance was traced

as many findings and takeoffs at Potsdam.

"These three factors with average high tension data for the same engine show that spark plug removal at 100,000 hr, and average rates of 0.05-0.05 to 1000 hr," says a Selvania engineer, "and you can understand one of American's major reasons for changing over."

R-2800 engine operators may expect to change plugs every 600 hr, or since per engine change, he added, because the low-tension system reduces engine wear by as much as 65 percent and the rods materially in firing partially fused plugs.

• **Altitude Test-Schedule** can be evident during the test of the first low-tension ignition system in a pressure chamber. The operator independently measured the chamber altitude to 60,000 ft instead of the intended 10,000 ft. The low tension system continued to fire perfectly. This test has been reported on each system developed to date. Yet a pump-type high tension system can fire at 100 hr at that altitude, among other things.

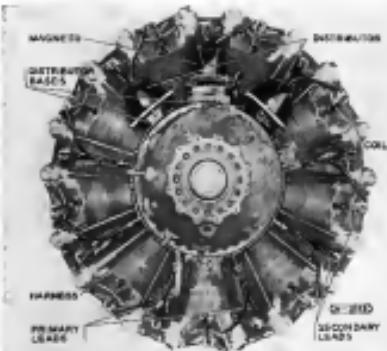
When a pilot had a rough engine in early days, drivers were he could much forward and find a dead cylinder by feel. Today complex instruments are required. Engine vibration had little effect on a Curtiss J-33's wooden footplate prop. Dead cylinder and the vibration they cause in modern engines have posed serious design problems to manufacturers of today's constant speed, controllable pitch propellers.

Prayor requirements of an ignition system for current propeller-driven engine aircraft, according to Selvania, are:

- Reduction of sparking current
- Increased ability to fire perfectly loaded plugs
- First Low Tension System. Selvania has tackled the problem of developing low-tension ignition system in 1953 for its large, stationary, external combustion engines.

The company devised the "LTA" system of ignition. The magneto generates low-tension current which was fed to the distributor and leads. A timer timer advanced to each plug converted it to high tension current.

It soon became evident that this type of ignition equipment was perfectly adaptable to aircraft engines. This idea was given added strength during the Korean conflict when the aircraft engines, which had been designed for low-tension ignition, were used in high-tension current.



FRONT VIEW of B-1800 mounting low tension system. Note coils adjacent to plug.

to ensure spark behavior in the dashboards.

In 1941 Scintilla gave priority to two projects in an effort to solve the difficulties:

• Separating the distributor component. This was done and proved successful.

• Developing a low tension aircraft ignition system. Once the initial potential of this study was realized, the company decided to increase its efforts to create a universal aircraft application. Factors were relative simplicity of the system, its ability to reduce plug erosion and reduce susceptibility to plug fouling.

By 1942, Scintilla had delivered its first two systems to the Wright Aircraft Corp. for evaluation—one for the B-534, the other for the B-536.

During the next year, Pratt & Whitney received a system for the X-B-500 PWE and CAA approved that the company did not receive until 1947, and CAA approval came through in 1949.

Concurrently, the company is also evaluating low tension replacement for the PWE, X-B-500 and B-5160C.

• Ignition Systems Classification—Scintilla recommends that ignition systems be classified. The following was cited as a source with which to do this:

• High Tension Systems—Distribution of more than 1000 v.

(a) Audio frequency
(b) High frequency

• Low Tension Systems—Distribution of less than 1000 v.

(a) Audio frequency
(b) High frequency

Of these four classifications, Scintilla

uses the category of an ignition system for a partially loaded spark plug. It will vary with the frequency or rate of rise of voltage on the primary inductance. The frequency is controlled mainly by the electrical constants of the secondary circuit—inductance in the secondary coil and capacitance. Since these are both greatly reduced, in low tension, rate of voltage rise is increased and maximum leakage resistance is reduced to a greater extent.

It is believed that this was also true for high frequency ignition, even to a greater degree, but claimed as advantage in the lower cost of plugs for the low tension system.

► Outlooks—Scintilla sees a bright future for its low tension system and claims:

• Diversified and costs advantage of the system can justify conversion and simplification of its low tension cost.

• Industry acceptance of the principle of low vs high tension ignition is growing.

• Continued military use of spark plug ignition systems now seems indicated, on which low tension systems will be used.

• Rapid development is taking place of low tension ignition equipment for easier for non-aviation purposes.

The company presently is engaged in the development and manufacture of aircraft and marine ignition systems, jet aircraft starters and accompanying magnetization starters and starters, audio interference filters, electrical connectors and related products. New applications include aircraft engines, ships and electrical starters.

Redundant Will Make Debrand Simulators

Debrand flight simulators will soon be built in England, Ray T. Hadley, president of the Curtis-Wright Corp., Croydon, N. J., has announced.

An arrangement of the X-B-500 low tension system to give the equivalent of two V-12 cylinder ignitions instead of one V-12 cylinder output often for radio noise.

• Low Tension Theory—Boyer said that the removal of the secondary coil from the generator and the concentration of voltage adjacent to the spark plug brought about these advantages. Since the capacitance of the secondary circuit is greatly reduced, the energy discharged across the electrode gap is decreased.

The three factors controlling plug plug erosion are lost, time and the accompanying electrical force (energy). These are all decreased, he claimed, with low tension.

Maximum leakage resistance is the



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The reliability demanded, has important aerospace and military significance, Hadley said. "It was recognized as something with the stated policies of the U. S. Air Force, and the U. S. Army European Air Forces, and so did not care to mention it because it's classified." By enabling them to produce for them other equipment that requires at the lowest possible expenditure of dollars."

Curtis-Wright says the first simulator to be built by Rediff will be for the Boeing 777 for delivery to British Overseas Airways Corp.



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These magnesium "sweat-grip" like sheet plating sheets were used in the outer wing leading edge and nose portions of the fuselage surface of the B-52. To keep its weight at a minimum, over 10,000 lbs. of lead, using magnesium sheet and aluminum were dropped on the structure of this aircraft—over 1/20th of the value of the lighter structural metal in the world.

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NEW AVIATION PRODUCTS



Apron Refueler

A fresh approach to aircraft refueling—along with tracks and departing from the usual conception of pit refueling—is exhibited in the Aero Cell, a telescopic trailer recently developed by the Witten Corp., New York.

The compact, relatively small semi-trailer unit can easily accommodate the time required at refueling aircraft refueling more than once. It already has created considerable interest among airline officials. The City of New York Authority has already one unit at Teterboro Airport, New Jersey.

Manufacturer of the Aero Cell is the Construction Equipment division of Todd Shipyards Corp., 3110 Forty-Fifth Ave., Elizabeth, Queens, N. Y. W. Witten is responsible for engineering and sales.

The Aero Cell is a completely self-contained mechanism, except for underground supply lines leading it electric current, fuel and fire-extinguishing fluid. It consists merely of a cylindrical steel cell positioned on a hydraulic lifting truck. By lifting a dead load over electric switch, the cell can be extended to a maximum height of 125 ft. or less than a minute or can be retracted into the ground, flush with the ground surface.

An integral cover at the top of the device is strong enough to support the weight of the heaviest commercial cell and load, according to Todd. The cell, about 5 ft. in diameter and 20 ft. high, contains fuel, oil, water and water, fueling and defueling controls, CO₂ hose and nozzle, small walkway and protective railing which automatically extends and retracts as the cell is raised or lowered.

These units are designed to be installed in pairs on the apron, so that when the plane times into position a cell will be located at each wing.

To operate, an attendant steps on the flush cover of the refueler, opens a switch cover and raises it to a height somewhat above that of the wing leading edge. He then projects the walk-

way which extends to a point several inches above the wing structure and past the leading edge. The walkway does not have to touch the wing at any point, but provides an easy step-down to the wing surface.

To refuel, the operator opens the access cover to the hose compartment in the cell, presses a reflected switch and pulls the hose and nozzle over the walkway to the wing tank filler opening.

Todd trials indicate operating pressure of 100 psi would be required and the cell is self-adjusting, so that refueling pit head speeds for each aircraft—such times by a different connection. An advantage over regular pits is that the hose is deflected generally to the top for easier wing rather than under, removing the need for visually lifting and dragging it up and over the leading or trailing edge of the wing. By lowering the hose, the hose can be pulled out with the cell remaining flush to the ground.

Witten says Aero Cells can be produced with special equipment to boast fast delivery with over 200 gpm.



Big Plane Aid

A new addition to the family of aircraft ground handling equipment is the M-12 boat developed by Wels All-Steel Products, 10777 Clandair Blvd., N. Hollywood, Calif. This device is designed to maintain operation around large planes. It has a working height of more than 30 ft. and a 16,000 lb. capacity.

The device advantage claimed by the manufacturer is that it can rapidly be assembled into 10 standard sections and transported to any location. The boat is said to be highly maneuverable, permitting it to be moved quickly to a

new position or moved a fraction of an inch for installation problems requiring accurate and close positioning. It is particularly useful for installing engine, gear towers, tail sections and similar work.

Stainless and electroplated versions of the boat are available. Let height be fixed in the lower 10 ft. and about 6 ft. from the base which is electrically driven either on 240 or 110/230V 60 Hz, as current.

The unit moves on a triangular-shaped steelized base, mounting ball-bearing action, and rubber tires. Leveling jacks are provided for compensating field irregularities. Net weight of boat is 5400 lbs.



Lightweight Nutplate

Sheet-type, self-locking nut plates, made by Nut-Shell Co., 517 East 2nd St., Los Angeles, Calif., a lightweight aircraft landing gear component, are available in ANH-5 and -10. They have some dimensions as ANH-6P and ANH-12P aluminum nut plates and are designed to withstand high axial loads and temperatures up to 250° of the nut is approximately 1/8 in from center of all directions.

Replaces Templates

A new enforcement device to insure for template proper the exact contour of a model, doing away with the need for cutting and fitting templates, is being marketed by John-Latex Engineering Co., 4545 Defense Ave., Detroit 1, Mich.

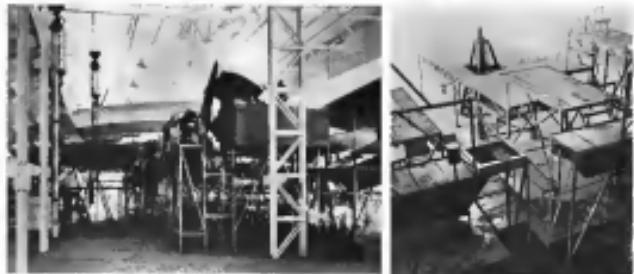
Called the "Duplicograph," the device can be used in a manner to be suitable for various casting methods or forming dies which frequently cannot be checked with ordinary templates. The first step is also can be used to show accurately the amount of spring-back and warp in a jet blade, a stamping die and other parts.

The device reportedly will speed up inspection procedures in manufacture of products which require close following of models. It gives cross-sectional sections to both sides, even when no voltage, current or other power is used (except for heat). The first prints out that results in a full contour check as compared with only a spot dimensional check by former methods.

AVIATION WORLD NEWS



GENERAL VIEW shows work platform of the maintenance dock, constructed by Alsthom International engineering personnel.



CONNIE is undergoing routine inspection at Bostock International Airport. No. 2 engine platform (right) has wing jacks in position.

Air-India Maintenance Simplified

Work dock for servicing company's Constellations incorporates many safety and time-saving features.

Bombay—A new work dock designed to take all of the weight of an aircraft and aircraft of Air-India's fleet of 114 aircraft, Ltd.'s Constellation has recently been completed here by the Eason Bleasdale concern.

The dock consists of a series of wall-platforms arranged to give convenient access to any part of the aircraft forward of the main cabin door. Safety rails surround all the platforms. Warning lights and beacons have been incorporated to guide those working on the planes and keep them out of the way of whirling propellers.

Quick Entry—The aircraft is raised

into position by a tractor, jacking a cable attached to the plane's nose-wheel. An electric motor drives wheels, which will automatically stop the tractor.

The entire dockside operation takes about five minutes. It is controlled by one man working "shop end up," light rock to the tractor driver and the person at the plane's ladder. Main wheel chocks on the ground stop the plane when it has entered the dock, automatically.

The chocks are removable to permit rotation of landing gear and work on the wheels.

Thus dock features are calculated

to make maintenance work quicker and easier. Platform steps which can be lowered out of the way to provide free motion of one of the propellers.

• **Mobile** over each cargo carrying door has block and tackle for moving and controlling passengers and propellers.

• **Push-in jacks**, hydraulically operated, for lifting the plane off the ground.

• **Emergency generator** with voltage regulation for providing 24 hr dc supply to aircraft, emergency services and operations of the aircraft's systems.

• **Mobile hydraulic rig** for general-checking hydraulic systems.

• **Propeller dollies**, on which propeller can be circled and rotated by means of concealed power, for convenient storage until needed.

• **House-Ground**—The dock, except for the length in which it is housed, was designed and built entirely by Air India engineering personnel.

Newer Look

British rework of old designs gives new types at minimum cost.

(McGraw-Hill World News)

London-British aircraft engineers have been giving some of their old designs the "New Look"—thus getting up-to-date types with minimum stress on the budget. The aircrafts which are by Vickers (the V.G. 3, improved Gloster G. B. 9 and F. R. 15 photo Mexican) and Scottish Aviation (the new communications plane).

The Vickers V.G. 3 planned as a Viking replacement is still in the design project stage and no decision has yet been made to produce a prototype. It incorporates the variable leading gear used on the Varsity RAF bomber conversion to minimize production. The V.G. 3 would carry 15 passengers at a cruising speed of 185 mph and could stage up to 1,575 miles on a range of two and visual would be standard.

The V.G. 3 would presumably be powered with two Bristol Hercules of approximately 2,000 hp each.

• **Marine Development**—Gloster's continued development of the basic Meteor design has resulted in two photographic reconnaissance versions.

• **G. B. 9** has three camera rooms in addition to four 20-mm gun turrets. The nose boom is slightly lengthened and fitted with a forward downward-angled view for one camera operator. Two other windows in the side of the nose permit oblique photography.

• **F. R. 15** is an improved high-altitude camera plane having the F. B. 9 aircraft with additional camera mounts in the rear of the fuselage. For optimum high-altitude performance the Meteor F. 15's longer span wings are fitted in the F. B. 10, as in the Meteor's first assembly, and the cockpit seat is set in at the Mk. 10.

• **New Pioneer**—Shorts Aviation's new Pioneer is a 20-passenger conversion of the A.4/15 liaison plane developed for the RAF several years back. Instead of the 250-hp D.H. Gipsy Queen fitted to the A.4/15, the Pioneer is now powered by an Alvis Leonidas air-cooled radial power plant of 320 hp. Top speed is given as 162 mph, cruising speed at 150 mph and range at 400 mi at 125 mph. Service ceiling is 21,000 ft. Takeoff run would be 50 ft and landing run 65 ft.

• **Mobile** The new aircraft, which is built in two halves, is reported to have reportedly taken off within the width of the runway. The performance is made possible by the use of tailless design.



F. R. 9, developed from Gloster Meteor design, mounts three cameras and has 20-mph range.



METEOR F. R. 15, improved high-altitude photo plane, has Meteor 5 wing and Meteor 4 tail.



dots and Fowler and split flaps resulting over 50 percent of the wing span. The Pioneer is now undergoing

flight tests for an airworthiness certificate and is expected to go into service in Australia following approval.

Bulgarian-Soviet

Air Group Formed

(McGraw-Hill World News)

Sofia, A. Bulgarian-Soviet Air Group has been established here to run Bulgaria's domestic airways. Succeeding the former Bulgarian Air Companies, the new company is operating three Black Sea routes.

It is reported that the new company is a 50-50 partnership between the Bulgarians and the Russians. Two-engine Soviet planes, described as "modern," with 20-passenger capacity are operating on the routes (about 450 miles each) between Sofia and the Black Sea.

Other routes are being maintained between the Bulgarian cities and the Czechoslovak Airways, which operate the frequently late Sofia-Prague via Budapest, and with the Soviet Airways, which run between Sofia and Moscow.

AERONAUTICAL ENGINEERING

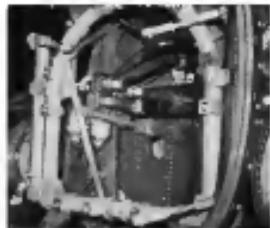


CLEAN nozzle during hot high-speed oil cooler tests. Engine intakes are behind propeller primary disk.



DUCT for engine air, use of style cuts split to go around drive shaft, returning to a round profile at the compressor face, consistent with duct

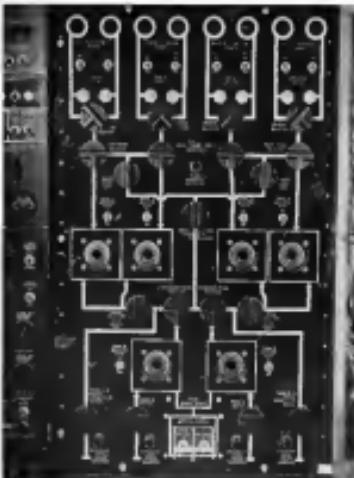
Turboprop Installation Design Highlights



SUPPORT structure for gear box, showing the guard mounting holes for the flywheel mounting.



GEAR BOX installation, with four mounts visible.



PUSH switch and system schematic, with quantity gages in "bank" square



PAIRED POWER UNITS of the original Allison XT40-A-1 turboprop, one from the bottom, facing forward. Behind oil cooler are four air bleed air engines to improve oil bath air cooling.

on XP5Y-1

First details of Convair's XP5Y-1 powerplant installation (Allison XT-40) point up some of the problems to be faced by designers of turboprop aircraft.

The accompanying photo and accompanying data were presented by E. H. Weyl of Convair's Division, Vought Corp., in a paper, "Current Turboprop Power Plant Installations," at the recent annual summer meeting of the Institute of the Aeronautical Sciences, in Los Angeles.

Convair's giant living heat unit is designed to be self-sufficient to adverse men and be able to operate from unprepared bases.

At that end, the entire powerplant can be maintained and serviced from the ground. The unit can be rotated or disengaged with great freedom, leaving equipment clear about the craft.

Much attention has been given to getting the necessary air into the engine and cooling air. The most efficient manner, Convair feels, is to locate the fan in the wing leading edge, within the propeller disk, for maximum air effect.

Ram air passes with a minimum of disturbance through a split duct (which divides around the drive shaft) to the engine inlet.

The air outlet, located below the engine, is supplied with cooling air from what Convair feels is an NACA high speed type of slot. Because the cooling problem is simplified when the heat is on the water, pressure air is bled from the engine compressor section on to engine jet downstream of the oil cooler.

AVIATION WEEK, August 1, 1960



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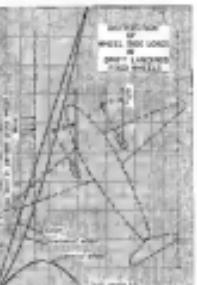
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Goodyear recessed gear on T-4 tailfin has 16 deg. camber after side of center.



Graph shows variation of wheel side load with deflection for Geuse recessed gear.



Graph shows variation of wheel side load with deflection for Geuse recessed gear.

Swivel Gear Interest Quickens

New developments in progress of swiveling landing gear promise to create additional aviation interest in this aspect of making commercial landing safe.

John H. Geuse, former CAA consultant, has brought out his own simplified type of pivoting gear. He estimates the cost of his gear to be approximately 50% less than an original equipment at cost to manufacture for base and material of only \$15 a unit.

Goodyear Aircraft Corp. has an announced sale of an flat pivoted gear to the Air Force. An Material Command will install seven of the sets on T-6 trainers for evaluation in pilot training.

Capital Airlines already has taken delivery of its first Douglas Super DC-3 with Goodyear recessed wheels and will put it and two other planes on Southern routes, for the fast commercial transport service experience on the

recessed gear in this country.

Difference in preference between the Geuse gear and others developed under CAA sponsorship, including the Goodyear recessed wheel, lies possibly in the restriction preventing the gear from pivoting forward. There will be little lateral movement in the Geuse gear, and the problem of side loads on the wheels and deflection of the gear is eliminated.

The former CAA consultant has stated that owners of existing gear should not be worried for continued price would be "reasonable" to wait for his gear development to become commercially available, thus guaranteeing the advantages of recessed gears until his device would be ready for sale.

Zero Reader Orders

Production orders for an undischarged number of Zero Reader flight instruments to equip Northrop F-89 jet all-weather interceptors have been announced by Sperry Gyroscope Co., Great Neck, N. Y.

The Zero Reader has already been designed for installation in the North American F-86D all-weather version of the Sabre, according to Sperry.



First in All-Weather Defense

LOCKHEED

The F-94 Jet Fighter

The Lockheed Aircraft Corporation is the largest producer of jet aircraft in the world.

Lockheed has built almost as many jet airplanes as all other U.S. manufacturers combined. They jet, jet aircraft leaders. For Lockheed is the jet aircraft leader at the rate of more than one a day—every day for more than five years.

First American operational jet was the Lockheed F-80, the famous Shooting Star, still the backbone of many U.S. squadrons. The first American jet fighter was the Lockheed T-33, which today continues to be the most popular jet training airplane.

Now, second jet fighter has been produced as successor to the Lockheed jet fighter. The F-94 All-Weather Interceptor Fighter is the first production all-weather jet in full scale service for the U.S. Air Force.

The F-94 provides America with all-around defense, around-the-clock defense. Advanced radar equipment permits this jet to intercept and engage aircraft in the dark shadows and in adverse weather which would ground today's unarmored fighters.

Afterwards comes F-94 with superlative speed and maneuverability. And muscle, virile flight—characteristic of all Lockheed jetplanes the F-94 is perfect gun mount for its powerful armament.

The experience obtained in the design development and production of these three jet fighters is now carried over to the projected jet fighters in service to the Lockheed laboratories where the planes of the future are taking shape today.

LOCKHEED

Aircraft Corporation, Burbank, California

Look to Lockheed for Leadership



Avro's Orenda Gets Flight Check

Flight testing of the Orenda, power ful turbine engine being built by Avro Canada, has begun at Malton Airport near Toronto.

Two of the engines have been installed in the aircraft serials of a converted Lancaster bomber originally used by Victory Aircraft, Avro Canada's predecessor. The engines will then be tested over a wide range of flight conditions to supplement the hundreds of ground runs already already accumulated.

Part of the flight tests is to determine the performance of the engines before installing them in the CF-100.

Avro Canada's all-weather fighter, the CF-100, is the first Canadian jet in full scale service for the U.S. Air Force.

Much emphasis will be placed on evaluation of fuel systems and controls. Flight maneuvers will subject the en-

gine to loads and accelerations not possible to simulate in ground tests.

► **Boeing Convair**—The converted Lancaster is powered by two Rolls Royce Merlin piston engines in the midship nacelle, as addition to the two Orendas. Flight can be continued by these piston engines alone.

Simple ratings were submitted for the first and only two flights on the Lancaster. Complete instrumentation of the aircraft has been done, for possible extension of the flight testing and static testing.

A test observer's instrument panel has been installed in the midship's position, and photographs are located to the rear of the fuselage.

Performance data on the Orenda are erratic. So are all the data on the Lancaster, as far as endurance, range and performance go.

DH Comet Features Submerged Antennas

The sleek look of de Havilland's jet transport, the Comet, is due in part to a completely submerged antenna system developed by Marconi's Wireless Telegraph Co. of England.

The Comet's six feet long aerials are craft to be folded, although the Airspeed Ambassador is noted to have such a system.

One of the Comet's electronically sensitive parts from the fuselage attachment and serves as a high frequency antenna. Detachable tips of its six and submersible bases the VHF and ULS aerials. A medium frequency gun antenna is submersible in a dielectric pedestal in the nosewheel door, and the ADIF loop is mounted in the fore-edge tip under the fuselage nosecone.

The U.S. cable path indicator antenna is placed behind the windscreen and the ULS marker, DME and radio altimeter antennas are all housed in nosecone fairings.

In addition to the submerged antenna system, the remainder of the Comet's radio communication and navigation equipment has been encapsulated and centralized by the Marconi company.

Test Fire-Resistant Hydraulic Fluid

A Civil Aeronautics Administration DC-4 has passed 250 hours of flying time with Hallibuttagard H-1 fire retardant fluid in its hydraulic system at the Standardization Center in Oklahoma City. Only minor problems, such as seal swelling and steel clogging, have developed.

A CAA DC-3, operating from the same base, has accumulated several hundred hours using Hallibuttagard U-4 fluid.

Corrosion of magnesium brake components has been the only trouble encountered so far with this low-pressure system.



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some from more accurate knowledge of loading conditions, the operating stresses produced by these loads, quality control and endurance tests. No effort should be spared during the design of a new helicopter in investigating all the factors of the aircraft and dynamics of the aircraft.

► **McDonnell**—Today's customer requires the highest percentage of aircraft parts known to be good in the removal and durability of major components for peaceful operation and survival.

One reason for the disparity between rotary and fixed-wing craft is in the encouraging instructions on the operating life of the engine parts. Contrasting to these instructions are lack of operating experience, isolated failures, incomplete stress tables and insufficient statistical data on load and operating.

The case, it was stated, would come when sufficient numbers of rotor hubs and transmission gears accumulated long service life without failure, permitting an extension of the arbitrarily limited overhaul period.

Prudell added a pertinent comment: "The maintenance factor is directly under the designer's control, and with sufficient experience open to it in design, further progress can be made."

► **All Weather**—Operational reliability, now said, and that demands the ordinary rate. blade snubbers. Blade snubbing is a problem. Cold effects this early.

And so, the designer calls for metal blades, uses the latest results of life testing of the blade snubbing problem, and selects a suitable snubbing device.

► **Vibraflex**—"Metal license is requested on the helicopter because of its vertical bounce as well as its lateral lift. Most of this bounce is due to the vibration although it is frequently overestimated. All the sources of vibration originating from the rotor system are not fully known as yet, but again in investigating them as to their seriousness and their effect on the structure as well as methods by which their dissipating and damping can be eliminated are definitely known and available to the designer."

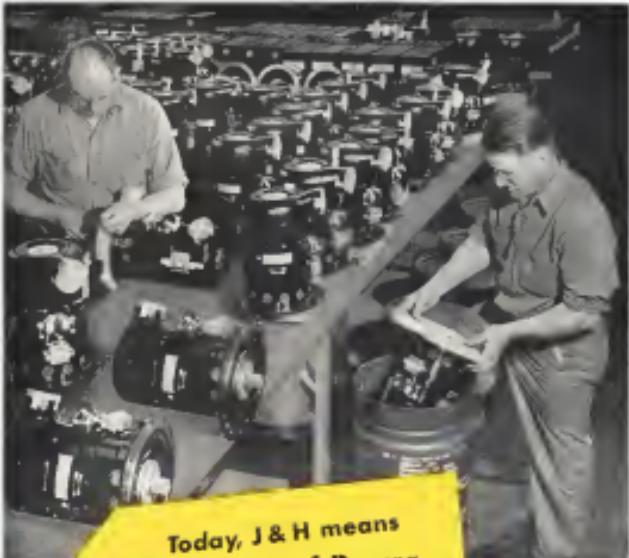
"These considerations must be given to the design in its original conception."

► **Compatibility**—Rotating parts cause most of the complexity of engine construction.

Some simplification of complicated dies can serve otherwise without eliminating the part to some extent when initially, going to jet power, for example.

"Much can be done, however, in simplifying detail design."

► **Cost**—Robby wing craft are penalized with many mechanical components, especially in construction in small lot production. And of course, the high cost per unit has not had the benefit of any



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KOLLMAN AIRCRAFT INSTRUMENTS



long-range production orders, so that tooling costs could be amortized over many years.

The instruments here are fairly slow-moving. Therefore for the application of existing machine tools, manipulators of materials and processes, and solvents production are the answer. And the first item can be supplied by existing designs.

► Flying Quality—The primary criterion here was maximum stability, resulting in "negative pilot effort" to maintain continuous blind flight.*

Lands can actually be reduced by the use of biplane or seaplane systems, thereby reducing some of the strain on the pilot.

While the problem of blind flight in the low-speed range is not far from an almost completely solved, methods to achieve this have been conceived. Although French did not specifically mention it, the auto-attitude device developed by Bell Aircraft Co. (Aviation Week June 25, 1948) would appear to be one of the applicable methods.

► Peyzajn-Pasicka stated that the next lead of the largest helicopter is less than one month from that of the input system.

The design can be carried both by increases in aircraft size, and improvements in the lifting efficiency, both of these can be dangerous.

These areas to be, for example, so obvious, least to the practical size of the helicopter rotor. This project, and Pasicka, plus a diameter sufficient to lift a light tank.

Rotor load loadings (loadings), but not comparable to engine wing loadings can be increased to boost the lifting capacity of present-day ships. Gradually, the use of lighter materials in speeds of construction, but research programs will provide information for the designer.

Strength and endurance efficiency increases also will improve the weight-carrying characteristics of copies, whose current useful load capabilities represent about one-third of the gross weight. For closing the action, a gas turbine, of the present price range, can increase the useful load by 35 percent. Payload, converted with useful load, depends on range, but even at 200 miles, the improvement is due to the turbine is about 15 percent.

► Range—Since most helicopter missions are short-hauls, this particular problem does not appear to be had. It can be solved by design, and it seems desirable to do so.

Any design solution, for example, besides the single- and dual-motor is one of the chief factors of aero dynamics.

Pasicka also said that the range could be extended by flight refueling.



1929

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1950



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depending on the helicopter's unique ability to hover above the water, whether off or on land.

Then, in an effort to solve the problem by avoiding it, because any aircraft range can be increased through the addition of fuel. What is important is that the range parameter of miles per gallon, or gallons per hour, be optimized through design-aerodynamic cleanliness, increased load-carrying ability, engine improvements.

Speed-Held is faced with the problem of range at a fixed speed. Prendis stated that "we have made success in this area in the past by pointing out that the forces on an aircraft do not travel great distances and therefore high speeds were not a necessary part of our performance requirements."

Technically, the thing that keeps helicopter speeds pegged to a low level is sticking of the retromotor blade. And, as is well known, sticking can be overcome by either increased speed or increased angle of attack.

There are two factors, said Prendis, that can be done. And he again emphasized at the moment of this interview, adding that the other consequence of the helicopter still does not equal that of the P-115 engine.

To go faster, one needs more power, even with clean aircraft. A little price justification by the speaker, who recently added a propeller or jet thrust to the helicopter designs, led to a guaranteed speed in excess of 230 mph, nearly doubling today's operating velocity.

► **Composite Design.**—There are all the engineering refinements and the art of teamwork in engineering craft. Prendis did not point this out and put them together, probably preferring to do that later in a military competition. But taken in sum, the helicopter could be:

► Larger, because of increased structural efficiency.

► Faster, due to higher rotational tip speeds and aerodynamic cleanliness.

► Stronger, because of increased tank loading and the substantiation of the greater power weight ratio of the gas turbine.

► Safer, with special techniques for blade flight, with vibration-free references and extended service life.

► Simple, helicopter, with metal blades, easy maintenance and accessibility, and maintainability is the total design.

► On the Way—So bigger and better rotary wing craft are in the offing. Their proximity depends on the design, on research programs, on customer needs—and, of course, on some favored government orders.

And if the manufacturers take Prendis' advice, the only thing tomorrow's helicopters will have in common with today's will be the rotting wings.

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With 19,000 Flying Hours Between Them—
Four Businessmen Tell Why...

"RYAN NAVION HAS THE QUALITIES PROVEN MOST IMPORTANT"

—BEN. WILLARD, ROBERT AND TOM McGARREY

"More pleased with our choice every day," write four businessmen-brothers, all former transport or military pilots, now operating their own Chrysler-Plymouth dealership in Miami, Florida. "We spent many hours visiting the various personal-business planes, but we chose the Navion to fit the qualities proven most important for our purpose." Two to ten thousand hours experience as

Air Force, Navy and Pan American pilots taught these 4 men to recognize the value of the Navion's unique combination of speed and safety, ruggedness with ease-of-flying. They found, too, the Navion "flies like a big plane; rides like a big plane. Service pilots should know that the Navion handles like a real plane. It's comfortable, good looking, and the enclosed gear makes cross-wind landings simple."

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

THERE'S A NAVION FOR EVERYONE—PRICES START AT \$9485.00



RYAN NAVION 240. The ideal plane for those who want modern safe air transportation at minimum cost. Features 265 hp Continental engine, has 35 cu. ft. cargo space, life 1615 ft. payload with full tanks. Ideal for business, pleasure, etc.



RYAN NAVION 250. Room for four big people with plenty of luggage. Can cruise at 140 m.p.h. in a percent sound flying. Superb soundproofed and insulated. Equipped with dual controls, VHF radio, cowls. Seats and easy to fly.



RYAN NAVION 340. Economy-powered to cruise at 161 m.p.h. 900 miles in 10:00-9. Out-cruises, outlands, lands shorter than anything in its class. The 340 is the Navion at its very best. Write today for complete free information.

Rely on Ryan RYAN AERONAUTICAL COMPANY, 488 LINDBERGH FIELD, SAN DIEGO, CALIFORNIA.

AVIONICS

Indicator Monitors Power Supply

Bendix development warns of a.c. supply failure, low voltage; features small size, lightweight indicator.

Failure of power supply for gyroscopic flight instruments can now be detected quickly by means of a new warning device.

Now in production at the El Cajon Power division of Bendix Aviation Corp., the indicator will give warning of either low system voltage or failure in one or more phases of the power supply.

Not only warning will occur several minutes before gyroscopic failure, which gives the pilot ample time to switch to a standby power supply.

Small Size. Physically, the power failure indicator is about the size of a standard vacuum tube. It is normally mounted near the electric gyro flight instruments.

Principle of the indicator depends upon the still torque characteristics of a tiny reflector motor mounted inside



A cup-shaped reflector coil, half painted black and half transparent, is mounted on the front end of the motor shaft.

A glass cover, half painted black and half transparent, encloses the mounting coil.

Normally, the induction motor is supplied by the ac power supply. The rotor works against a permanent magnet, and the hair spring torque equals the motor torque.

• **Display Method.** Under these conditions, the instrument face is completely black.

Should the system voltage drop to 22 volts (from its normal value of 26 volts), the hair spring begins to overcome the motor torque, and the transparent half of the moving coil begins to move.

The degree to which the coil becomes visible depends on the amount of voltage drop.

Should the system voltage drop below 18 volts, it should power failure occur in any phase, the transparent half of the moving coil becomes completely visible.

Specifications. El Cajon Division engineers designate the power failure indicator as Type 36105, with two subtypes whose difference lies in the value of permanent magnet available—yellow or orange.

Weight of the reflector is about 5 gm., including plug and leads. It has a polarized, hexagonal socket, with three 36 in. leads.

Power required is 26v., 480-cycle, 1-phase alternating current, with a phase relation of 90°.

For Vital Control Circuits in Curtiss Electric Propellers



IT'S BENDIX-SCINTILLA
ELECTRICAL CONNECTORS

CHECK THESE ADVANTAGES

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- Radio-Proof
- High Strength
- High Accuracy and Reliability
- Power Ports that can carry up to 1000 watts
- No additional solder required

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SCINTILLA

SCINTILLA MAGNETO DIVISION OF
BENDIX CORPORATION



Unparalleled dependability is the standard set by Curtiss propellers and American Airlines in their selection of equipment. Bendix-Scintilla is therefore the logical choice for aircraft electrical connectors. For further information, write to American Telephone. In this, maximum circuit capacity must be arranged in compact and efficient with maximum and minimum lead requirements on the catalog. Recommended whenever possible to use the Bendix-Scintilla connector in conjunction with the Bendix-Scintilla electrical connectors and joint materials can be supplied.

*Speed up
with
Precision
on
Valve and Seat
Grinding
with Dependable*

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ALBERTSON & CO., INC.



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SIoux PERFECTED DUAL ACTION VALVE SEAT GRINDER with Ball Bearing Holder

Precision work in fast time by the almost unbelievable speed of this valve seat grinder. Perfected dual action provides constant fine vibration for grinding accuracy and dispersion of cuttings. Uniform finish is assured.



SALES & SERVICE

Public Forum

Free monthly aviation meetings begin as sales aid by Teterboro school

Teterboro School of Aeronautics is going after prospective students with a new sales approach—monthly aviation forums open to the public.

The first session, staged without the customary publicity planned for new meetings, gathered two students. In addition, an aeronautics teacher, Charles Willis, former president of Willis Air Service, between the talks will serve two other purposes: boost morale of the present student body and build enrollment.

Willis also believes the new show will not considerably cut the cost to the school of \$30 for each new student led.

» **Capital Spending**—Willis is planning to get students for three forums who can easily start current aviation operations and facilities without being held down in these forums by official construction.

Each forum will present three speakers. Willis says he is negotiating for local radio station cooperation and may have the dimensions recorded for broadcasting.

As part of the forums also, the audience will be taken on a tour of the school's facilities to the interest of getting up. The school's records show that most of those taken on such a tour have signed up for courses.

Willis considers the forums a good time for the aeronautics students in the course. He estimates that about 25 percent of his students drop out before completion, and feels that by offering these lively discussions by men active in different phases of the industry, the original enthusiasm of the students can be maintained.

Civilian Schools To Train AF Mechs

The Spartan School of Aeronautics at Tustin, Calif., and Cal Auto Technical Institute, Glendale, Calif., have been awarded contracts totaling \$792,000 for training 350 USAF mechanics and engineers mechanics.

The two schools, sharing equally in the contracts, will train 175 enlisted personnel each. Training periods will last 36 weeks, which is the same length of time enlisted by career military

technicians giving the shortest instruction.

The program is being tried by USAF to test the practicability of technical training by civilian contract. It follows completion of a study which was conducted last year by Standard Research Institute.

Report of the Institute pointed out that enlisted technical training could be effected through utilization of administrative services offered in military organizations. Accompanying military administrative facilities, functions and personnel will allow for mounting a military training base (technical or non-technical) on sites where enrollment is cost effective, a high quantity of trained personnel are guaranteed immediately, and no profit is taken.

The two schools were chosen from among 41 civilian agencies submitting proposals to the Air Force for the test training project.

Training in the new schools was scheduled to begin last week and will be completed by June 16, 1951.

BRIEFING FOR DEALERS AND DISTRIBUTORS

» **Plane Ownership**—More than one-half of U.S. private planes are located in California, Los Angeles county representing 17 percent of the total. There are more than twice the number of men over U.S. 60 years. Upper Middle West and East hold the lead in total number of planes: California has 115,994 planes registered, Texas 6951, and Illinois has 4529.

» **Plane Time Payments**—A "buy-now-pay-later" plan to make helicopter purchases easier by the providers of payment private and operator exchanges has been roundly welcomed by older helicopter users. The Paha Air, Calif., has established a "helicopter financing division," using a capital amount built up from steadily increasing sales to finance purchases.



STEVE WITTMAN'S BUTTERCUP

This neat little high-wing monoplane, built by racing pilot Steve Wittman back in 1950, is flight test by R. E. Bechtel used single seat landing gear, a tail unit by him to set new design ideas and to provide transportation to no seats. The Buttermilk seats two side by side. It is powered by an 85-hp. Con-

cordia liquid fuel with a propeller using prop. Top speed is said to be 130 mph, cruising speed 120 mph, and landing speed 50 mph. A typical takeoff-type drag landing gear. It now undergoes testing on the plane. Wittman has also built a four-place personal plane, now being tested.

only formal complaint to CAB against air coach. It said that Eastern Air Lines' and Delta Air Lines' Chicago-Minneapolis coach traffic would result in revenues below the cost of operations, adding that the Civil Aeronautics Act, requiring economic policies and rules, CAB approved the traffic despite the natural objection.

How much revenue is lost or saved diverted from the air? The surface carriers expect zero, but estimate it at "hundreds of thousands of dollars."

The information comes in a CAB survey showing that about 30 percent of the air coach travelers in April and May, 1949, were diverted from the airroads. And between San Francisco and Los Angeles (which is about 100 miles) in all travel, the first-class Pacific Coast passengers were 57 percent "Deplaners" but 57 percent of their passengers drama, first-half 1948, at the competing airline passenger traffic gained 17.2 percent.

Wings Over America-FRP thinks that air coach is here to stay even though its low fare places the airline's financial strength in jeopardy. The federation, which sometimes doesn't see eye-to-eye with the Association of American Railroads, thinks the rail roads must count attack now, both with improved equipment and lower fares.



SABENA PICKS UP AIRMAIL COPTERS

Two Bell 47D helicopters to be used by Sabena for air mail pickup and delivery service in Europe are loaded into one of the airline's DC-4 cargo planes at Midway for transport to Belgium. The Brussels cargo center will be operated by Sabena under

contract with the Belgian post office. Deliveries will be made at Luxembourg, Liège, Tongia, Hasselt, Brugge, Tournai, Heusden, Antwerp and back to Brussels. The service is reported to make possible 24-hour New York-Belgium airmail delivery.

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"The often," FPR states, "the railroads have been, without applying the lesson, that a full train of two-car passenger

trains passengers will produce a higher net return than a half-empty one at constant coach fares." The federation noted that domestic travel for income more than \$704, which brought the figure from 2.2 to 3.75 cents.

Survey showed that passengers flying less qualified helicopters were traveling for the emergency route. Federal regulations require the return to suitable strengths in their crews on long overnight hops.

Training Programs—American Airlines, which has more than 100 DC-3s available for the Pacific airshift, is accepting applications for complete pilot's certificates. Recruits must have 300 actual hours of aerial navigation experience, either instrument or primary, and want to physically qualify.

Acceptable candidates will be given transportation to the West Coast, where they will undergo training in a helicopter school operated by Pan American Airways. They will draw either during the training. Candidates failing to complete the training course will be given return transportation to point of origin.

Feeder Exec Pay Bumps CAB Ceiling

Feeding executives who want to earn more than \$12,000 monthly now have to change jobs.

The Civil Aeronautics Board, in its recently setting new rate rules for Trans-Texas Airways, disclosed the portion of President R. E. McKnight's salary which was over \$12,300. McKnight was paid \$12,494 last year and \$12,000 in 1948, with a small part of expense being allocated to the company's Staff and Service division.

Rating Executive—CAB said it does not question the propriety of the rate of remuneration of the T-TA president from the viewpoint of the name's stockholders. But, it concluded, "where the return comes in heavily as mail pay support, we believe that the rate-making purpose the maximum salary which should be deductible by the government is \$12,000 per year."

McKnight was the highest-paid feeder-line executive last year. Remuneration was all American Airways President Robert L. Love, who received \$11,600.

CAB drastically increased T-TA's mail pay for bank periods to prevent the carrier to show a 7 percent profit on its recognized investment. The mail rate per piece mile was boosted from 65 cents to 95 cents.

A proposed incentive sliding scale rate for the future will prevent Trans-Texas to break even at a passenger load factor slightly in excess of 23 percent.

AVIATION WEEK, August 7, 1950

Rooftop Heliport for Los Angeles

Los Angeles is to get a rooftop passenger heliport on top of a twelve-story downtown building.

The heliport will be financed by the Pacific Mutual Life Insurance Co. and be located on the firm's building at Sixth and Grand, Los Angeles. Airways which now operate certified mid-sized helicopter services will lease the rooftop facilities. CAB has already applied to the Civil Aeronautics Board for authority to operate passenger helicopter services in and around the Los Angeles area.

In Six Months to Approval—Plans for the heliport include a helipad, top story passenger lounge reached by express elevator and connecting directly with the helicopter landing area by escalator. Air passengers would be able to land at Los Angeles International Airport from the downtown rooftop in no more than 15 minutes. Construction would be timed to allow for early completion.

CAB and Mutual had demonstrated such a heliport for compliance with Board requirements that it is not in the public interest to permit the company authority to render regular air service.

Boeing's order is to be effective on Aug. 13 unless Mutual requests reconsideration or a hearing.

The Civil Aeronautics Board and Mutual had operated from New York to Miami, San Juan and Buffalo with success regularly. In January, 1949, the result of a report of CAB and the Federal Trade Commission was that which can be operated by private non-airline companies without the need for a license.

Recent Civil-Mutual has been active since 1942. During the first quarter of the year it made 32 flights between New York and Miami, and 16 between New York and San Juan. The carrier uses two DC-3s but has also been using DC-4s. In Boston has been granted principally through ticket agents, one, including 26 in the New York area.

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The plan contains a complete "power package," including a Pratt & Whitney R-1830 engine with nacelle and accessories, one of which \$117,000, TAA says. Also aboard is all the equipment required, including the 1948 helicopter, a Bellanca 40-200, the landing skid and all required special tools.

Based at Rio de Janeiro, for \$65,000 is financed by a pilot, copilot and two engine mechanics who are on call at all hours.

Troubleshooter for El Presidente

A special "troubleshooter" C-46 cargo plane has been assigned to work over Pan American World Airways' newly reorganized El Presidente flights between New York and Buenos Aires.

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Seattle Crash Suit

The 25th damage suit filed in Seattle as the result of the crash one year ago at the end of the runway at the Seattle Boeing Field of a commercial airplane has been dismissed because sought to be filed.

Named as defendants in the latest action are \$11,000—see Air Transport Associates, Inc., Air Transport American Sales Co., Inc. and Air Line Services, Inc. This is the last suit to name both the service defense and ticket selling companies as defendants.

Seven persons were killed when the plane, with 12 persons aboard, struck electric wires and exploded in a residential area shortly following takeoff.

Braniff Posts Profit

Braniff Airways turned in a \$402,000 net profit during the first six months of 1950, and President T. E. Braniff has predicted as equally profitable second half.

This year's earnings compare with an \$18,500 loss during the same 1949 period. Operating revenues exceeded net profit figures by \$1,317,000, and total expenses also increased by \$175,800. Total passenger mileage was up 8.5 percent.

Rental of a DC-4 for military service in the Pacific is not expected to affect the carrier's earnings adversely.



AMERICAN'S SOUTHERN HEADQUARTERS

Artist's sketch shows the \$2-million one-bilion-dollar lounge and office building which American Air Lines will start at the new George Fox Woods International Airport. Construction is reported to begin on the building, with completion scheduled for September, 1951. The building will be 185 ft. wide by 225 ft. deep, providing 46,700 sq. ft. of larger areas adjacent by 45,700 sq. ft. of

shops, maintenance and office areas. Bigger portion of the building will have a structural system of built-up steel under paving a clear span opening of 20 ft. American's new headquarters will be located in the new building, and its maintenance and office quarters will be located in the office area. Associated architects for the lounge, lounge and office division are Joseph R. Polich and Preston M. Green.

AVIATION WEEK, August 7, 1950

48

What's Ahead in Congress

War Investigations

Congress will keep a close eye on the expanding war establishment program.

The War Investigating Subcommittee, headed last week by Chairman Miller Tydings of the Senate Armed Services Committee, will fill the role of the Senate Truman Committee of World War II, whose harsh and somewhat questionable criticism of the performance of aircraft manufacturers and Air Force officials in a few isolated cases was induced by considerable helplessness to the industry and the military in solving manpower, poverty, and other problems.

Frederick Sen. Lyndon Johnson (D., Tex.), a belligerent commander on the aircraft carrier Midway in the last war and an aggressive proponent of air power, heads the group, which includes Sen. Virgil Chapman (D., Ky.), Sen. Ernest Gruening (D., Alaska); Sen. Lester Hunt (D., Wyo.); Sen. Styles Bridges (R., N. H.); Sen. Leverett Saltonstall (R., Mass.); and Sen. Wayne Morse (R., Ore.).

On the House side, the Capitol Hill Armed Services Committee has already quietly moved toward an closed-door session with top defense officials to determine the issues for the year. U. S. showing in Korea in the light of the \$50 billion spent on defense over the past four years, the present status of the country's defense, and the requirements to assure U. S. capability to meet future Russian challenges. Shortly, Vernon Capital Hill's spokesman for the Joint Chiefs of Staff, will make a short speech outlining the present state and future defense requirements. Whether reorganization is called for, Vernon will do it on parole.

Meanwhile, resolutions for two additional House investigations are being pushed. Rep. Claude Pepper is seeking a subcommittee to look up a war investigating subcommittee of the Appropriations Committee, of which he is chairman, and Rep. Emanuel Celler, the New York New Dealer who has made a specialty of attacking corporations, is backing a seven-member special House investigating committee to ascertain war contracts. The House leadership is expected to leave war investigating to the competent hands of Vernon's Armed Services group.

Airmail Separation

A \$300,000 appropriation has been voted the Senate Interstate and Foreign Commerce Committee, headed by Sen. Edith Johnson, for studies looking to the establishment of airmail mail pay rates on domestic airline routes.

Johnson plans to contract with private accounting firms for the studies. His theory is that the best place of "soliloquy" to air carriers should be written off as subsidy to the routes which are being furnished unprofitable air service.

Waiting on the House Interstate and Foreign Commerce Committee over legislation authorizing the Civil Aeronautics Board to make a \$300,000 study and directing it to separate service mail payments from subsidy payments to air carriers appears to be much ado about

nothing. The House Appropriations Committee last steady voted notice it will approve funds for a CAA study.

Prototype Testing

Chances for enactment of legislation authorizing the Civil Aeronautics Administration to spend \$12.5 million over a five-year period on testing of prototypes for new commercial transport and cargo planes is enhanced by Congress' desire to remain in session indefinitely. The bill is still before the Senate for action.

Independent air carriers will open their files against it today in testimony before the House Interstate and Foreign Commerce Committee. They claim it will do nothing toward solving the pressing need for additional air travel, but will only interfere with the development of "lame birds" to accommodate an additional proportion of the population.

New Laws

Another measure on which Congress completed recent action will:

- Permit CAA to finance advanced engineering or other training of 25 of its personnel annually, at cost of its advanced training courses.
- Authorize the Secretary of Agriculture to apply rules and regulations designed to protect U. S. agriculture from importation and spread of injurious pests to air commerce.
- Make false identification of aircraft a criminal offense, subject to a \$1000 fine, three years imprisonment, or both. The measure is aimed at deterring illegal smuggling and smuggling by air.

PAA Investigation

Count on the House Judiciary Subcommittee, headed by Rep. Celler, to vote away from an investigation of Pan American Airways—until the heat over the recent North Atlantic airway decisions has subsided. The subcommittee was scheduled to open hearings on monopoly charges against PAA in July. "It's still on our agenda—the staff is studying the matter," Celler told Aviation Week. "But because of the Korean situation, I don't think we'll be able to get around to hearings for a few months, at least." If PAA's acquisition of American Overseas Airlines "is related to its monopoly position in the airline industry, I am sure the staff will investigate it," he said.

Air Safety Board

The House Interstate and Foreign Commerce Committee is set to approve legislation setting up an independent Air Safety Board, being apparently pushed by the Air Line Pilots Assn. But the overwhelming odds at present are that the legislation will be killed off in the Senate.

Waiting on the House Interstate and Foreign Commerce Committee over legislation authorizing the Civil Aeronautics Board to make a \$300,000 study and directing it to separate service mail payments from subsidy payments to air carriers appears to be much ado about

initial approaches on instrument landing systems.

• The Ziro Reader shows an easy indicator . . . bending, minute, altitude and instrument landing information . . . does normally supplied by the essential instruments. By merely keeping the two pointers of the instrument at zero, the pilot has at his fingertips the only needed system approaching the performance of stabilized automatic flight control.

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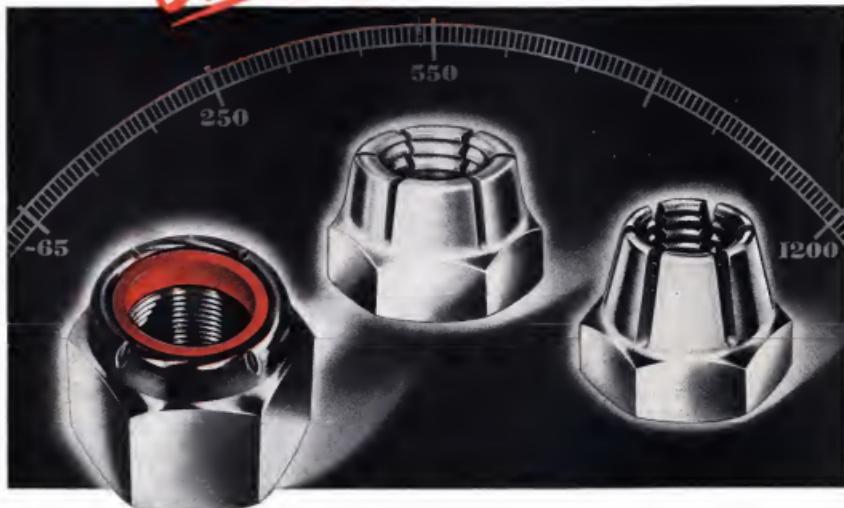
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ESNA spans the
temperature field

-65° F to +1200° F

with **SELF-LOCKING
ELASTIC STOP NUTS**



—famous Elastic Stop Nuts protect
permanently against VIBRATION! IMPACT!

With the addition of the new Z-550 and Z-1200 series, ESNA now has a specific nut design for all temperatures ranging from minus 65° F. to plus 1200° F. Self-locking, in both fully seated and positioned settings, these fasteners provide permanent protection against vibration, impact and stress reversal.

The two new nut designs represent the most efficient solution found by ESNA engineers after detailed research and production line studies of fastening problems encountered under elevated temperatures. Both fully meet ESNA standards for controlled quality and full interchangeability on class 3 bolts with minimum torque scatter. This controlled torque which is a feature of all ESNA nuts assures uniform bolt loading and permits more compact design, with resulting weight reduction. It also simplifies maintenance problems and speeds up field replacements.

Specifically, for applications between -65° F. and +250° F., the nut with the famous red fiber collar offers unequalled protection against vibration, thread corrosion and liquid seepage. The ZM and ZE nuts are designed for sustained temperatures up to 550° and the Z-1200 series has been engineered to withstand multiple cycles of exposure to extreme temperatures up to 1200° F. without seizure. Like all Elastic Stop Nuts, these fasteners are readily removed—do not damage threads or gall the finish—and they can be reused.

HERE'S A CHALLENGE: Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information, write for literature. Elastic Stop Nut Corporation of America, Union, N. J. Representatives and Agents are located in many principal cities.



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OVER 450 TYPES AND SIZES IMMEDIATELY AVAILABLE FROM STOCK